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Schairer et al.

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(54) **PHOTOGRAMMETRIC RECESSION MEASUREMENTS OF AN ABLATING SURFACE**

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(73) Assignee: **The United States of America as Represented by the Administrator of the National Aeronautics & Space Administration (NASA)**, Washington, DC (US)

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(51) **Int. Cl.**
G06K 9/00 (2006.01)

(52) **U.S. Cl.** **382/154**; 348/47; 356/601

(58) **Field of Classification Search** 382/154;
348/47; 356/601, 603
See application file for complete search history.

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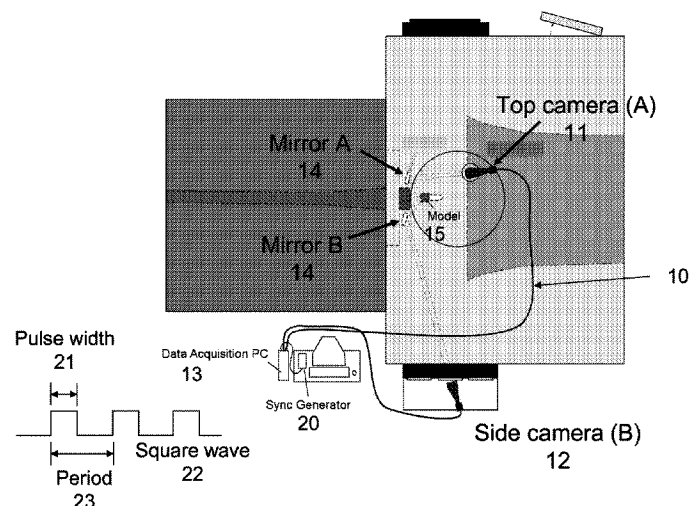
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(57) **ABSTRACT**

An instrument and method for measuring the time history of recession of an ablating surface of a test article during testing in a high enthalpy thermal test facility, such as an arcjet. The method advances prior art by providing time-history data over the full ablating surface without targets and without any modifications to the test article. The method is non-intrusive, simple to implement, requires no external light source, and does not interfere with normal operations of the arcjet facility.

9 Claims, 8 Drawing Sheets



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FIG. 1

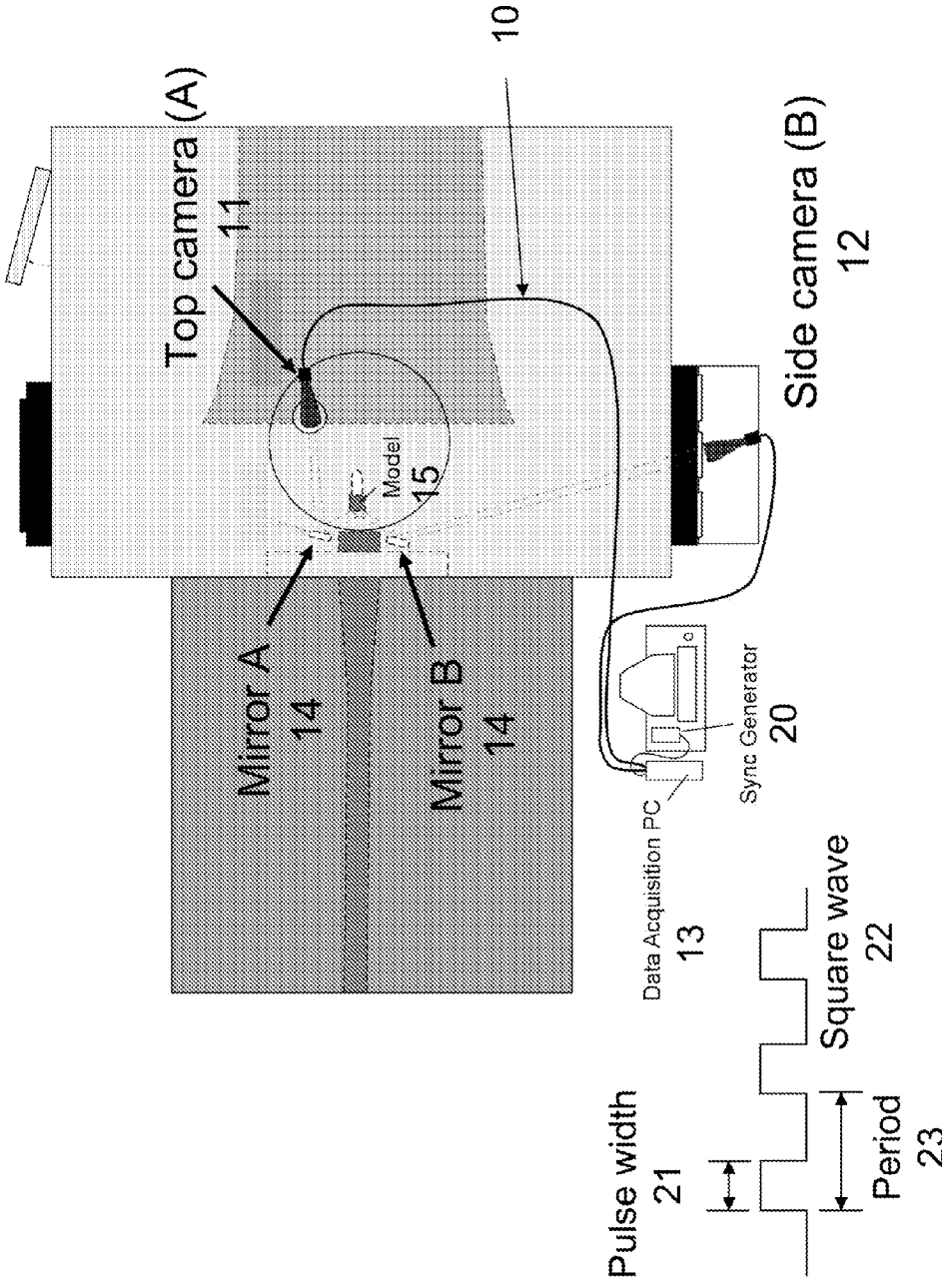


FIG. 2

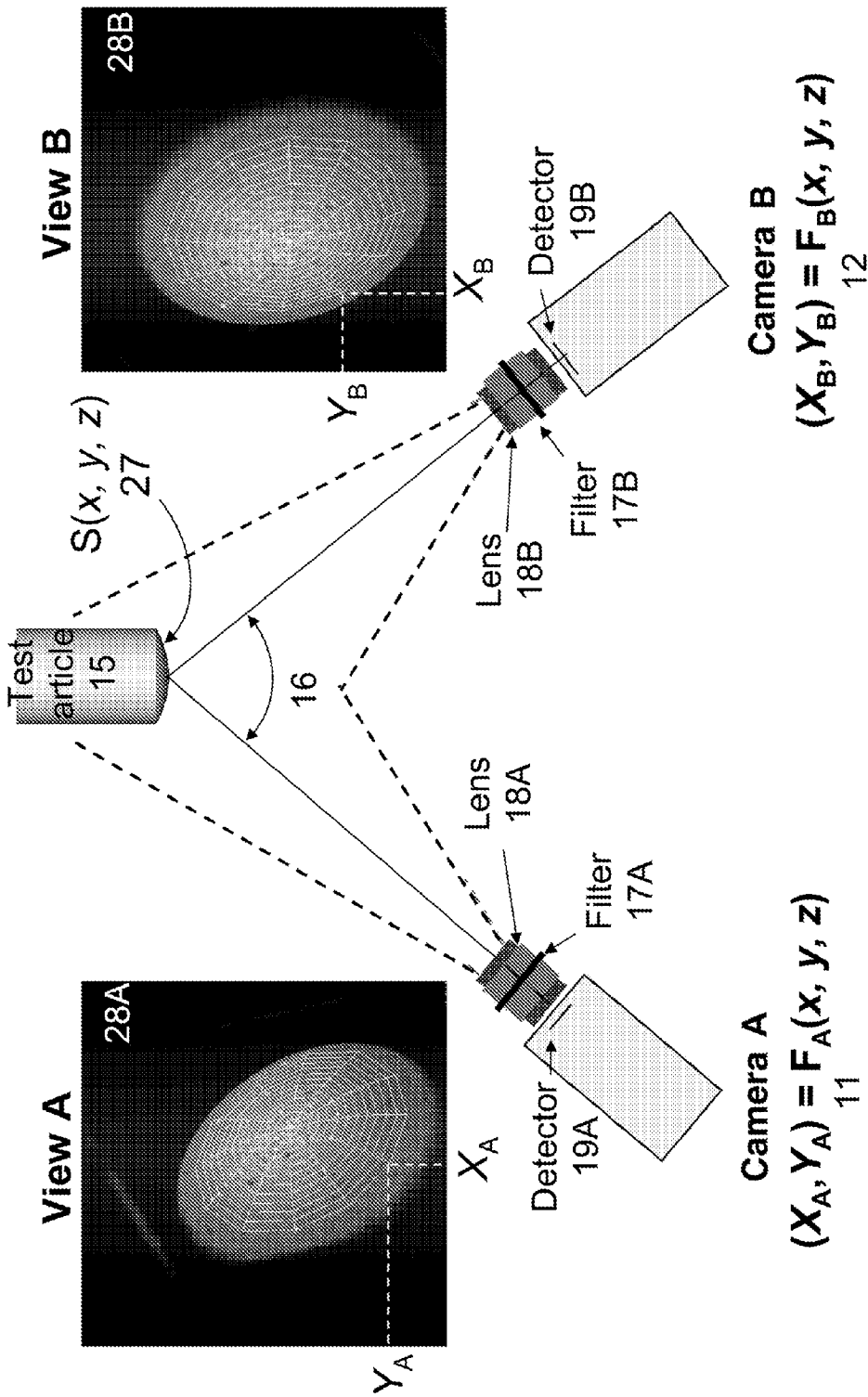


FIG. 3

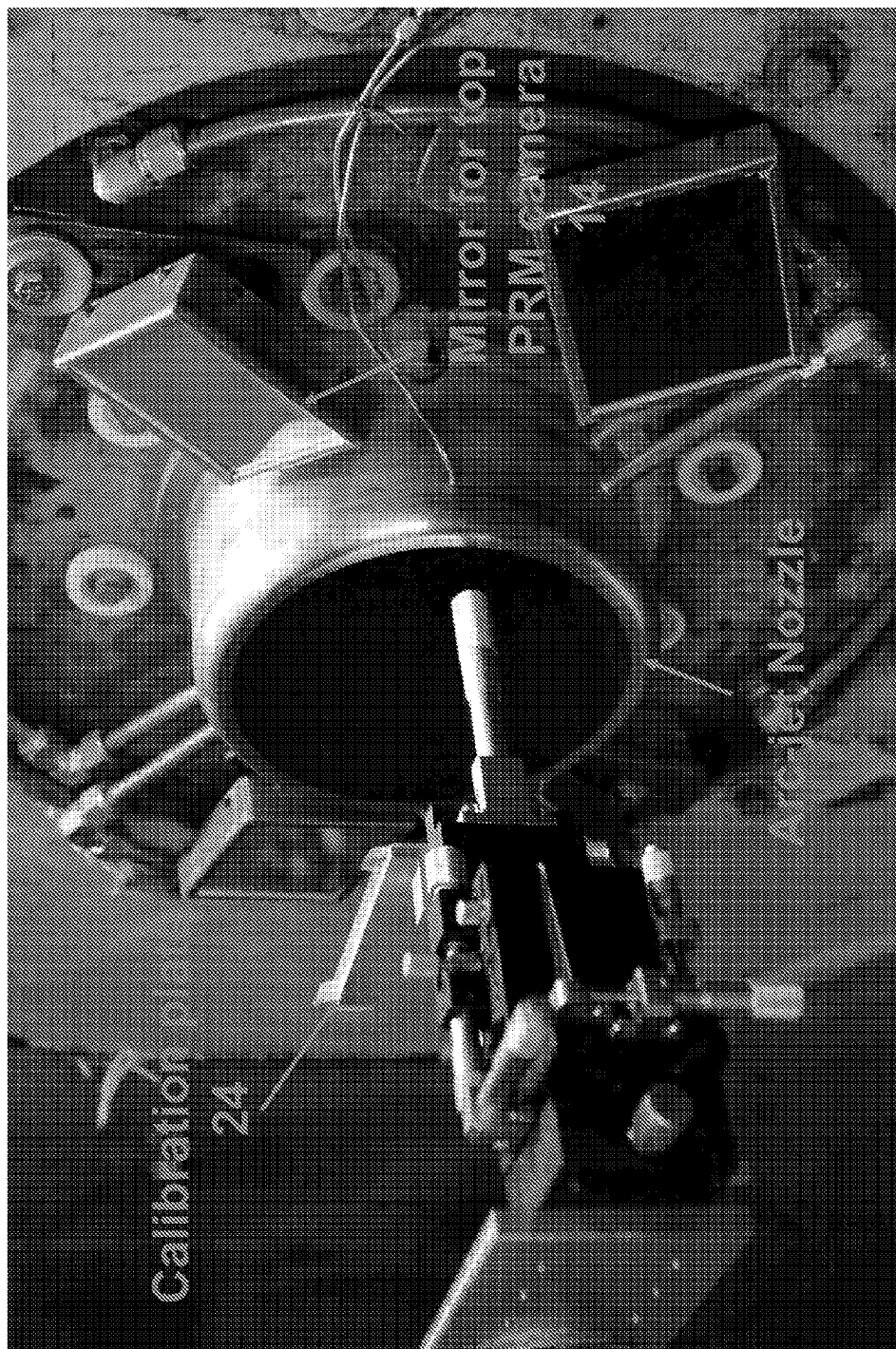
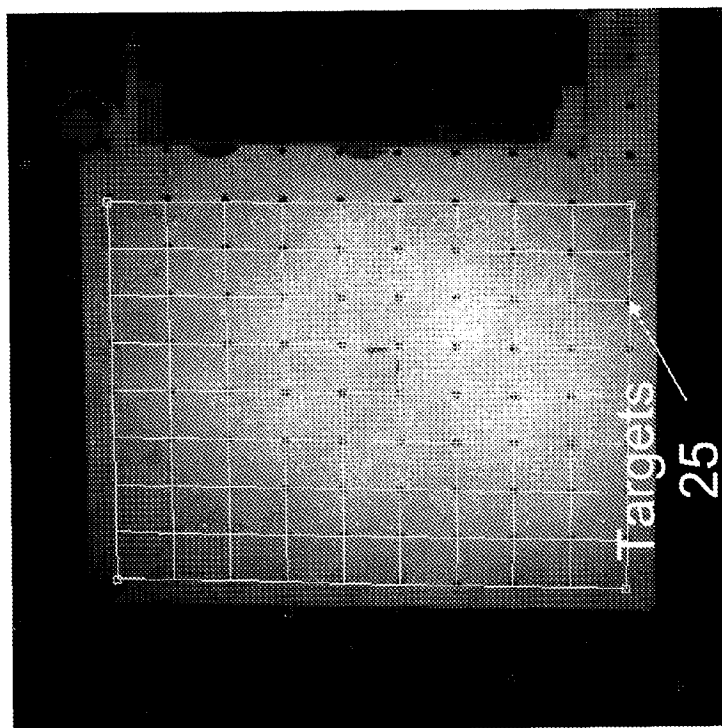


FIG. 4A

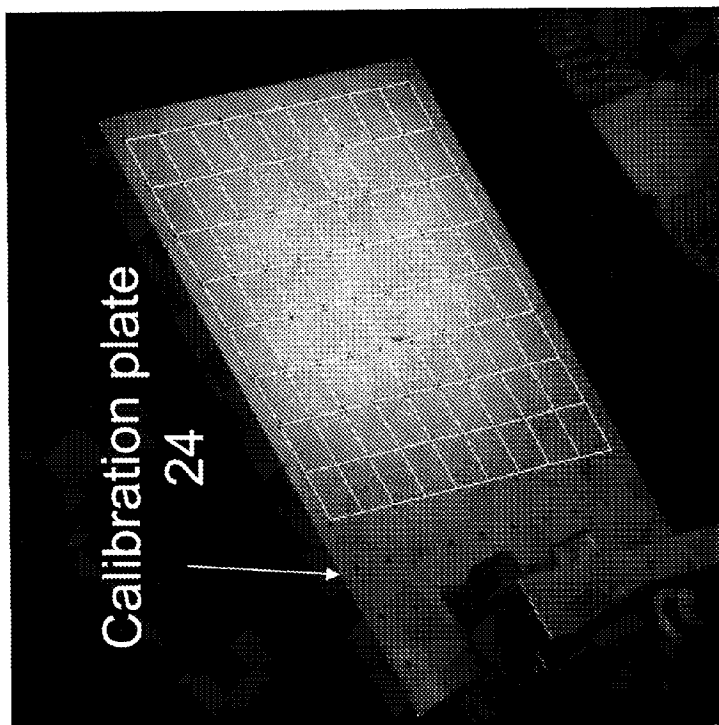
FIG. 4B

Calibration images

26



Side camera



Top camera

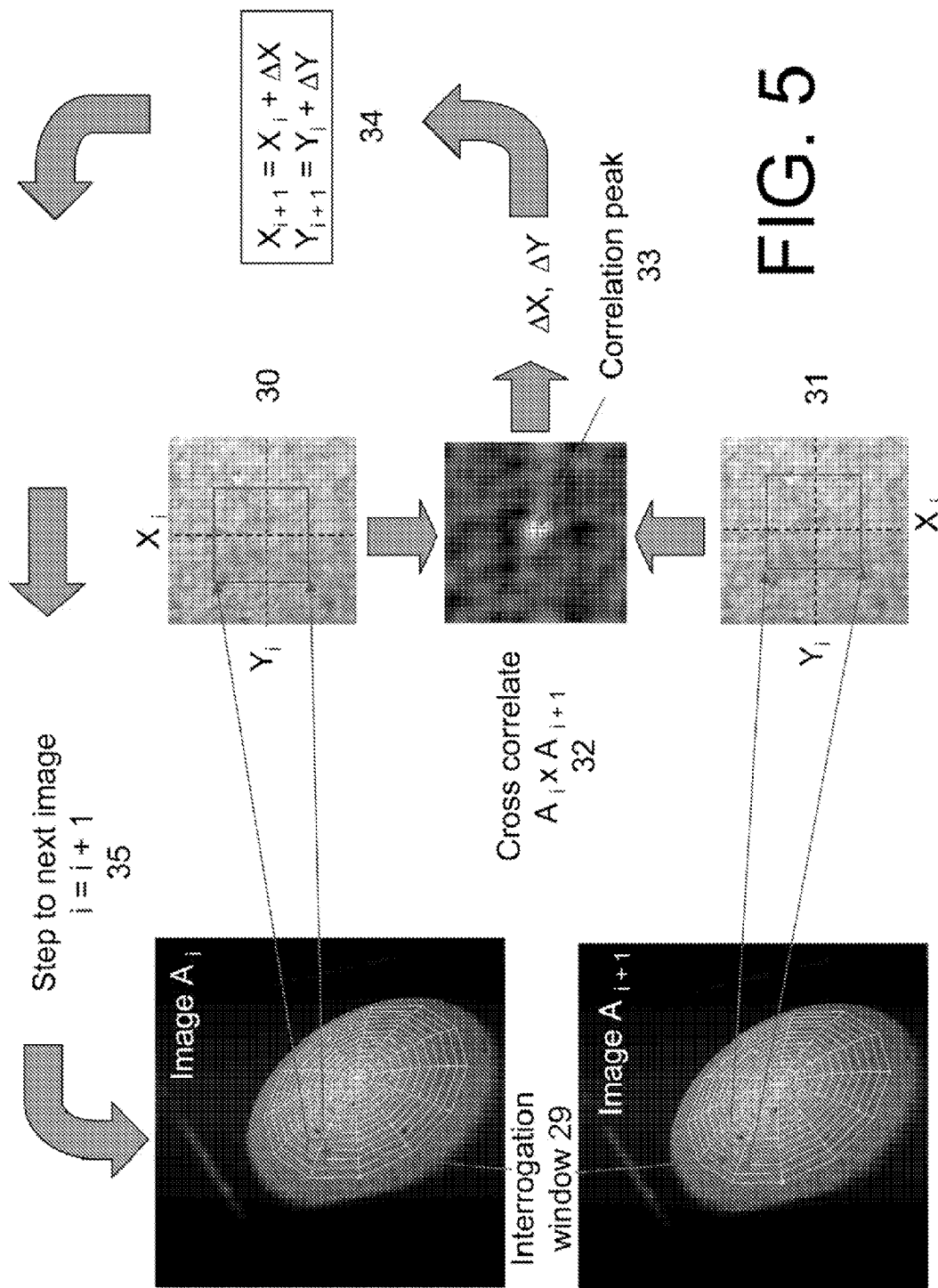


FIG. 5

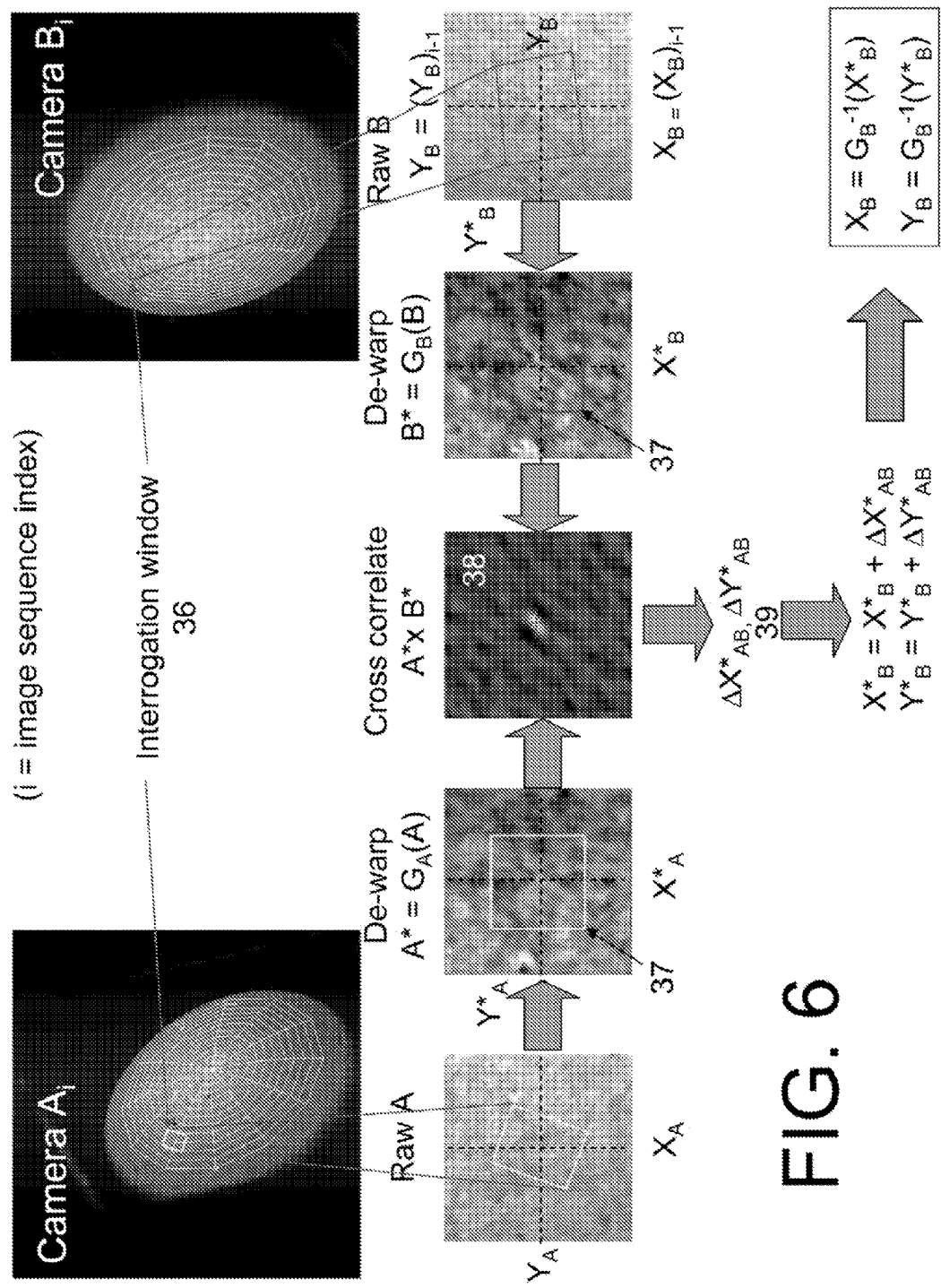
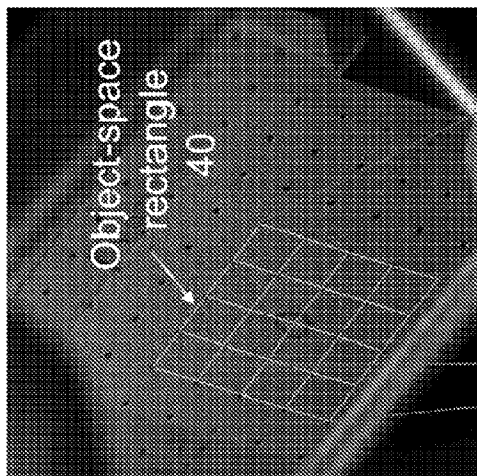


FIG. 6

FIG. 7

FIG. 7A
Raw
images

Camera A



Camera B

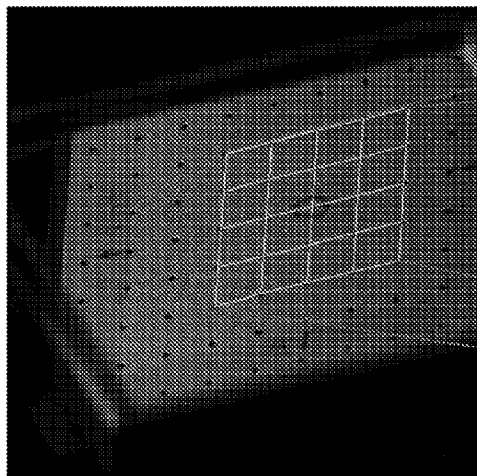


FIG. 7B

FIG. 7C
Globally
de-warped
Images
42

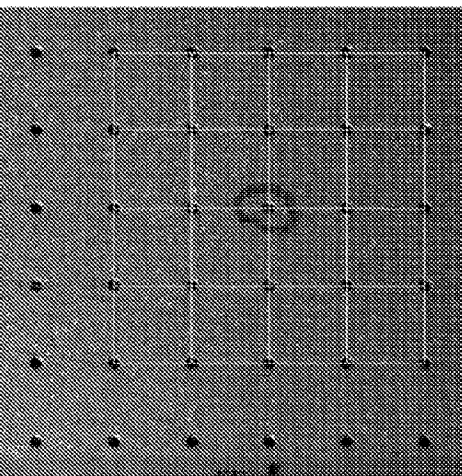
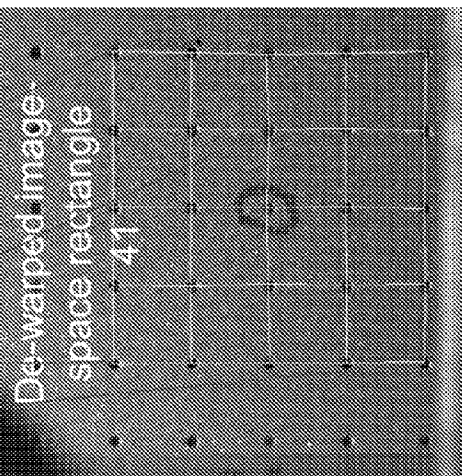


FIG. 7D

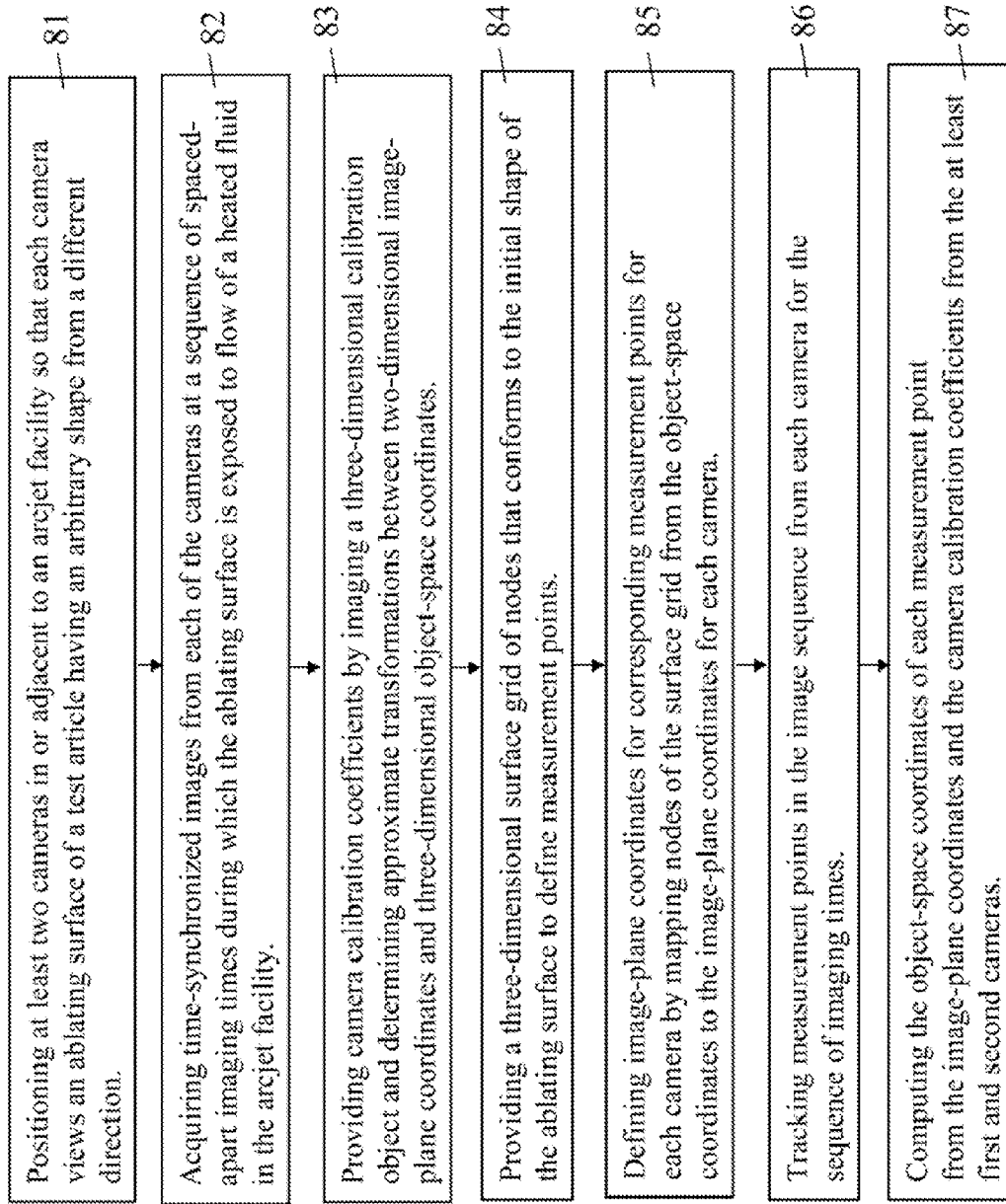


FIG. 8